No. 653,485. Patented July 10, 1900.

I. E. PALMER.

APPARATUS FOR DYEING.

(Application filed June 12, 1896.)

(No Model.) 2 Sheets—Sheet 1.

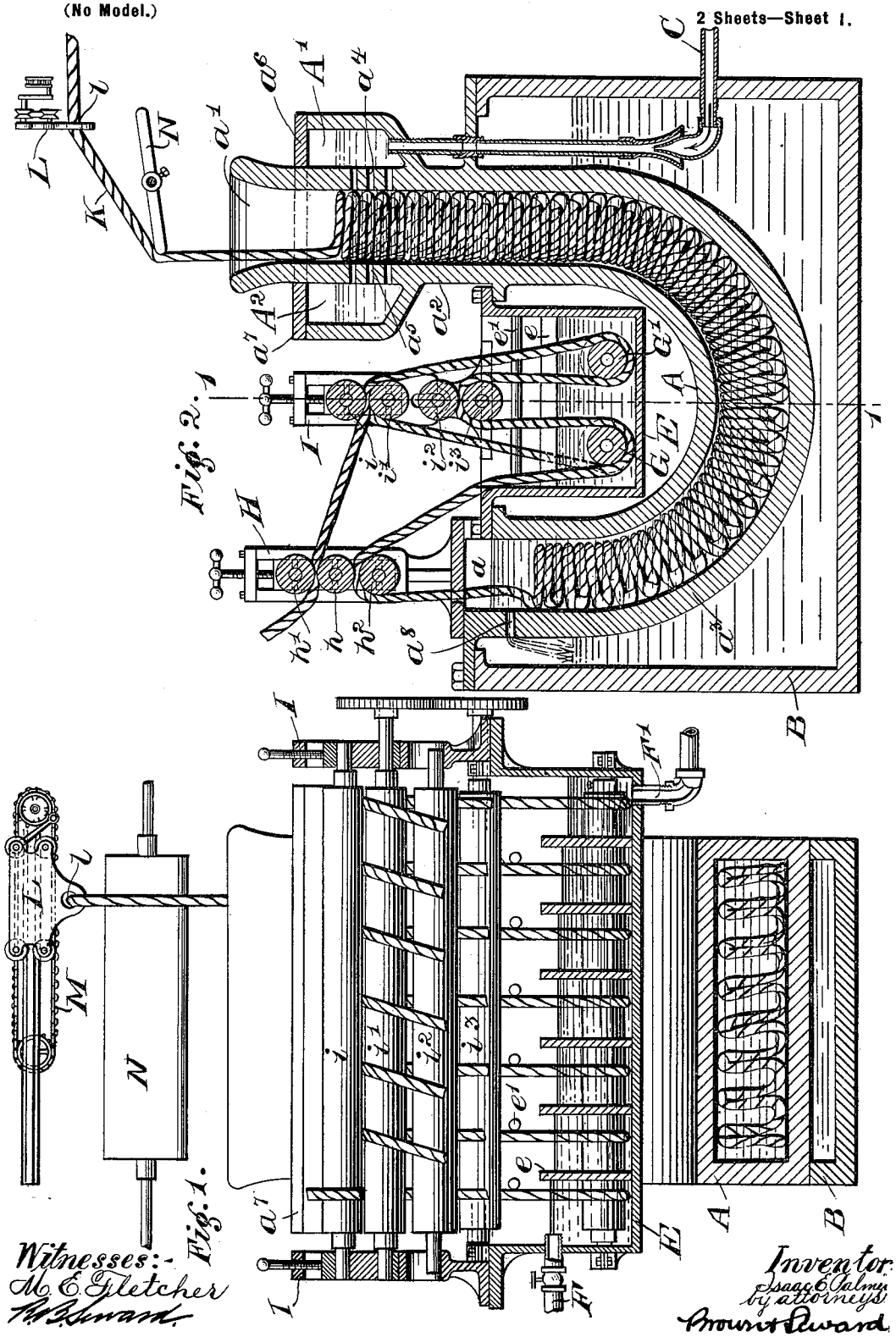

Fig. 1.

Witnesses:-
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W. E. Swan.

Inventor:
Isaac E. Palmer
by attorneys
Brown & Ward

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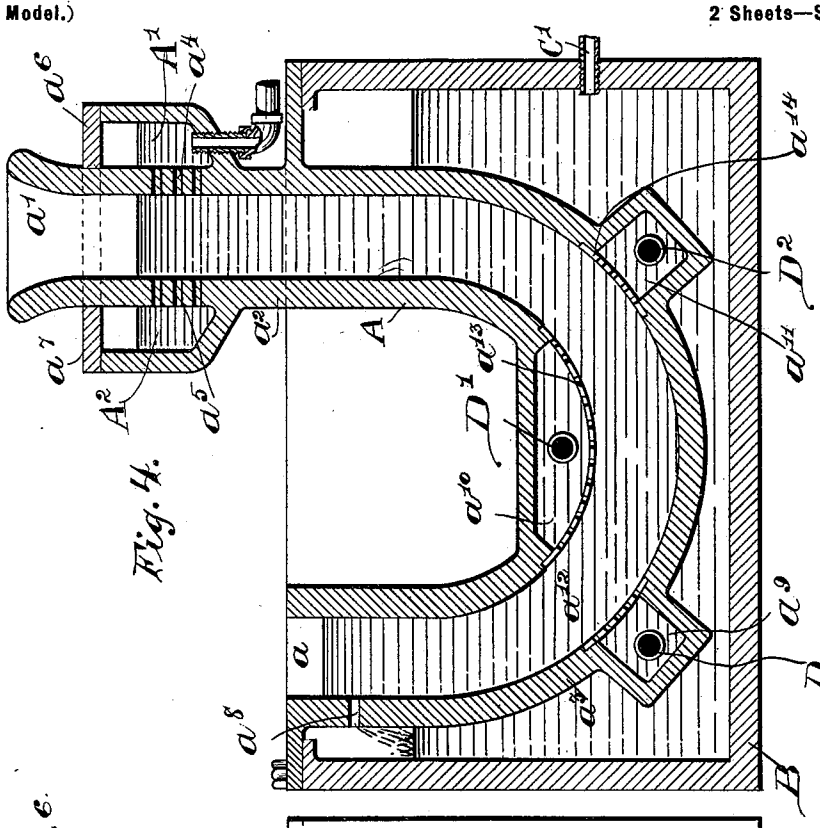

Fig. 4.

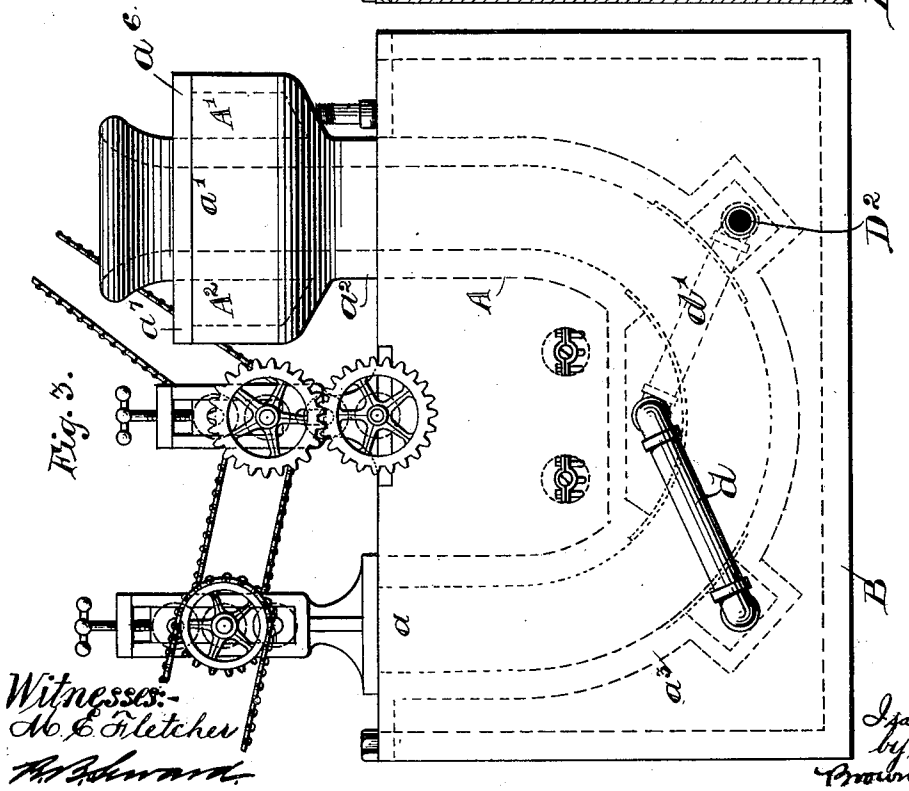

Fig. 5.

Witnesses:-
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UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

APPARATUS FOR DYEING.

SPECIFICATION forming part of Letters Patent No. 653,485, dated July 10, 1900.

Application filed June 12, 1896. Serial No. 595,376. (No model.)

To all whom it may concern:

Be it known that I, ISAAC E. PALMER, of Middletown, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Apparatus for Treating Cloth and other Materials, of which the following is a specification.

My invention relates to an improvement in apparatus for treating cloth and other materials, one object being to provide for passing the cloth or other material to be treated through a bend by floating it under the influence of gravity.

A further object is to provide means for treating the material to several different operations, such as steaming and washing it, bleaching and washing it, or scouring and washing it, &c.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a transverse section through the machine on the line 1 1 of Fig. 2. Fig. 2 is a longitudinal vertical section on the line 2 2 of Fig. 1. Fig. 3 is a side view of a modified form; and Fig. 4 is a central section from front to rear through the form shown in Fig. 3, the several rolls through which the material to be treated passes being removed.

The casing through which the material to be treated passes is denoted by A, and it is of J or U form and is open at both ends, as shown at a a'. In the present instance the casing is of J form, and the long upright is denoted by a^2 and the short upright by a^3. This J may be of a suitable width and depth to form the required-sized chamber therein for the passage therethrough of the material to be treated. The lower portion of the J A is contained in a suitable receptacle B, which receptacle is adapted to contain the liquid which is to form the bath for the material to be treated. The upper portion of the long upright or receiving end of the J is provided with troughs A' A^2, the interior of the said troughs having communication with the interior of the J through suitable ports or openings a^4 a^5. The tops of the troughs A' A^2 are preferably closed by suitable covers a^6 a^7. The short upright a^3 of the J is provided with an overflow-opening a^8, extending from the interior of the J to the interior of the receptacle B. The liquid with which the material is to be treated is fed first to the troughs A' A^2 and from thence to the openings a^4 a^5 into the interior of the long upright of the J at a point considerably above the outlet a^8 in the lower upright of the J. The liquid will thus fall by gravity and will fill the lower portion of the interior of the J up to the outlet a^8. From thence it will escape into the receptacle B.

In the form shown in Fig. 2 I have shown an injector C, entering the receptacle B and in position to force the liquid therein up into the trough A'. It will thus be seen that a continuous current is established when the injector is in use through the J A and the receptacle B, the same liquid being used over and over again.

In the form shown in Fig. 4 I have shown the liquid both as being fed directly to the trough A' and have shown an outlet C' from the receptacle B.

The liquid-bath for the material may be kept at the required temperature by any suitable heating means applied to the receptacle B, which means are not shown herein.

In the form shown in Fig. 4 I have shown the J as provided with suitable heating means for keeping the liquid-bath at the required temperature. In the present instance I have shown the said means as consisting of a series of pipes D D' D^2, connected together at their ends by pipes d d', whereby a circulation of steam may be established therethrough. The pipes D D' D^2 are located in suitable recesses a^9 a^{10} a^{11}, the said recesses being provided with suitable gratings a^{12} a^{13} a^{14} across their mouths to prevent the material being treated from entering the said recesses.

The apparatus for washing the material after it has passed through its liquid-bath is as follows: Between the long and short uprights of the J there is located a tub E, the bottom of said tub being provided with cross-partitions e, a little more than half the height thereof, and with cross guide-pins e'. In the present instance there are six of these partitions e and guide-pins e'. A suitable inlet F is provided at one end of the tub E, and a suitable outlet F' is provided at the other end of the tub. Extending the length of the tub E and below the tops of the par-

titions *e* are a pair of rolls G G', around which the material is passed for submerging it in the washing liquid. Over the top of the short upright of the J I locate a series of squeeze-rolls. In the present instance three are shown, which squeeze-rolls are mounted in suitable bearings H at the sides of the machine. The center squeeze-roll is denoted by *h* and the upper and lower rolls by *h'* and h^2, respectively. Over the tub E, I mount in suitable bearings I upper and lower sets of squeeze-rolls, the upper set of squeeze-rolls being denoted by *i i'* and the lower set by $i^2 i^3$. The several sets of rolls may be driven in any desired manner.

The material to be treated is denoted by K, and it is fed to the receiving end of the J A in ropy form by suitable mechanism. The mechanism shown herein is adapted for use in laying the material in folds back and forth across the interior of the J and at the same time lay it in rows along the interior of the J. The said mechanism consists of a carriage L, having an eye *l*, through which the material passes, the said carriage being connected to a suitable endless drive-chain M. A fan N is located beneath the carriage L. The mechanism for feeding the material may be driven in any desired manner, preferably by the same driving mechanism which drives the several sets of rollers on the apparatus.

Proceeding to describe the operation of my invention, the material to be treated is fed into the receiving end of the J in the manner hereinabove described, and the liquid is then fed into the interior of the J, and the downward flowing of the bath liquid will float the material being treated around the bend in the J and up to a position at or near the outlet of the J in its short upright a^3. The material from that point is led up between the rolls *h* h^2, and if it is desired to wash the material it is then fed down and around the roll G in the tub E in the space formed between the partition *e* and the end of the tub and from thence between the roller G' in the same space as where it first entered the washing fluid. From the roller G' the material passes between the rollers *i i'* and from thence down and around the roller G in the next space to the one just described. The material thence passes around the several rolls from one space to another until it reaches the last space, from which it passes through the rollers *i i'* and thence through the rollers *h h'* to any place desired. The material being treated passes first into the space in the tub from which the outlet extends and leaves the tub finally from the space in which the inlet of the washing liquid is started. In this manner it will be seen that the material finally leaves the tub where the washing liquid is purest. The washing liquid passes from one space to another through the openings in the partitions through which the rollers G G' extend, thereby causing a constant circulation from the inlet to the outlet.

By setting up a series of the apparatus above described it will be seen that the material may be fed from one to the other, thereby making up a continuous boiling, bleaching, and souring process combined with the amount of washing required. The finishing of the material being treated may be thus materially facilitated, thereby increasing the production.

It is evident that slight changes might be resorted to in the construction and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. An apparatus for treating cloth and other materials, comprising a casing having a bend therein and means for maintaining a flow of liquid through the bend for floating the material being treated through the bend by gravity, substantially as set forth.

2. An apparatus for treating cloth and other materials, comprising a receptacle for the liquid, a casing having a bend therein and communicating with the receptacle at points on opposite sides of the bend and means for maintaining a flow of liquid through the casing for floating the material through the bend, substantially as set forth.

3. An apparatus for treating cloth and other materials, comprising a receptacle for the liquid, a casing having a bend therein and communicating with the receptacle at points on the opposite sides of the bend, means for maintaining a flow of liquid through the casing for floating the material through the bend and means within the casing for maintaining the liquid passing through the casing at a predetermined temperature, substantially as set forth.

4. An apparatus for treating cloth and other materials, comprising a casing consisting of a longer and a shorter upright and a bend connecting the two uprights, a receptacle for the liquid partially inclosing the casing, the said longer upright being provided with an opening for the admission of the liquid, and the shorter upright having an outlet-opening to said receptacle at a point below the inlet-opening in the longer upright and means for feeding the liquid into the casing through the inlet-opening in the longer upright whereby the liquid floats the material being treated through the bend by gravity, substantially as set forth.

5. In an apparatus for treating cloth and other materials the combination with a casing having a bend therein, and means for floating the material being treated through the bend, of a washing apparatus arranged in position to receive the material from the casing after it has been floated through the bend, substantially as set forth.

6. In an apparatus for treating cloth and other materials, the combination with a casing having a bend therein, and means for

floating the material being treated through the bend, of a washing apparatus for receiving the material from the casing, the said washing apparatus consisting of a tub having an inlet in one end and an outlet in its opposite end, partitions extending across the tub to form a series of spaces therein and rollers extending lengthwise through the tub below the tops of said partitions, substantially as set forth.

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Witnesses:
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JOSEPH A. O'NEIL.